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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,116	11/19/2003	Kwun Yao Ho	61994.00003	7321

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EXAMINER

LAM, CATHY FONG FONG

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/717,116	Applicant(s) HO ET AL.	
	Examiner Cathy Lam	Art Unit 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 1-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

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1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-13, drawn to a lamination process, classified in class 427, subclass 96+.
  - II. Claims 14-30, drawn to a laminated multilayer substrate, classified in class 428, subclass 209.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by a different process such as by electroplating conductive material onto a dielectric layer then bonding the dielectric layers using adhesive material. The process as claimed can be used to make a different product such as a decorative art work.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Atty: Aaron Wininger on Sept. 14, 2004 a provisional election was made with traverse to prosecute the invention of group II, claims 14-30. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-13 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Drawings***

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: Fig. 8A numeral 802e, and Fig. 8C numerals 810b, 810c. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 809b & 809c on page 12 of specification is not shown in Fig. 8C. Corrected

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drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

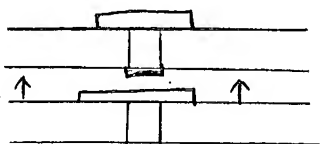
Furthermore, in Figs. 4H & 4I, numeral 402 is not pointing to the correct layer. Correction is required.

***Claim Rejections - 35 USC § 112***

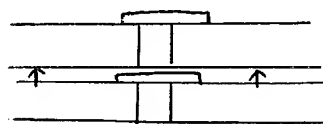
8. Claims 21, 17 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 21, there is no antecedent basis for "the first vias".

Claims 17 and 24 are structurally indefinite, as it is not clear whether or not "a metal layer disposed on said second ends of the vias" is a metal layer from the conductive layer of an adjacent patterned conductive layer on a dielectric layer (b) or another metal layer (a)?



(a)



(b)

***Claim Objections***

9. Claims 26 and 30 are objected to because of the following informalities: the two claims are identical. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

11. Claims 14-16, 20-23 and 27-29 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Takenouchi et al (US 5744758).

Takenouchi discloses a multilayer circuit board comprised of a plurality of dielectric layers, conductive patterns and via holes (Fig. 1).

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Each dielectric layer is a thermosetting resin film having metal layer formed onto its first surface. Each dielectric layer also has via holes formed in its thickness direction, the via holes are filled with conductive material (col 1 L 61-col 2 L 2).

The metal layer on the dielectric layer is formed into a conductive pattern and is connected to the conductive material in the via hole (col 2 L 3-4).

A plurality of the above described dielectric layers are laminated.

A pair of solder resists are respectively formed onto the uppermost and lowermost layers of the circuit patterns (col 6 L 30-34).

Since applicant has not distinguished the core substrate and the laminating layers (or dielectric layers), the examiner takes the position that multiple dielectric layers taught by Takenouchi resembles the core substrate and the dielectric layers of the present invention (Figs. 8-9). The examiner is also taking the position that in

Takenouchi the top surface being the 1<sup>st</sup> surface and the bottom surface being the 2<sup>nd</sup> surface. Claims 14, 17-18, 20, 24-25, 27-29 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Farquhar et al (US 6764748).

1st surface  
↑  
↓  
2nd surface

Farquhar discloses a multilayer circuit board comprised of a plurality of dielectric layers (or first and second dielectric layer) (52,62,72), conductive patterns (59,69,79) and conductive plugs (53,54,64,73,74).

The conductive plugs are formed in the thickness direction of the dielectric layers. The conductive patterns are formed onto one side of the dielectric layers and are in contact with the conductive plug(s).

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A solder layer is formed onto the surface of the conductive plug, on the dielectric surface that is opposite to the conductive patterns (Figs. 18-19). The examiner takes the solder layer is on the second end of the via.

The conductive patterns are joined through the conductive plugs by the solder layer (55, 56, 66, 75, 76) (col 17 L 18-28, Figs. 18-19).

The examiner takes the position that in Farquhar the 1<sup>st</sup> surface is the bottom surface and the 2<sup>nd</sup> surface is the top surface.

↑ 2nd surface  
↓ 1st surface

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 14-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takenouchi et al (US 5744758) in view of Farquhar et al (US 6764748).

Takenouchi teaches the present invention but is silent about having metal layer on the second ends of the vias.

Farquhar meets the shortage of Takenouchi. Farquhar clearly discloses that a solder layer (55,56,66,75,76) is disposed over the conductive via hole. The solder layer is on the dielectric layer opposite to the conductive pattern.

Both prior art are silent about having a heat sink disposed on its surface.



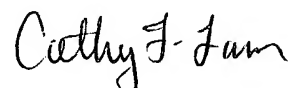
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In view of Takenouchi's teaching, one of ordinary skill in the art would instead dispose a heat sink on the surface because it could increase heat dissipation while the circuit board is in operation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Cathy Lam  
Primary Examiner  
Art Unit 1775

Cfl  
September 18, 2004